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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/882,413

06/15/2001

Shuo-Yen Robert Li

Li 19

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10/05/2005

AKIN GUMP STRAUSS HAUER & FELD L.L.P.
ONE COMMERCE SQUARE
2005 MARKET STREET, SUITE 2200
PHILADELPHIA, PA 19103

EXAMINER

PHAN, MAN U

ART UNIT

PAPER NUMBER

2665

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/882,413

Applicant(s)

LI, SHUO-YEN ROBERT

Examiner

Man Phan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10 and 11 is/are allowed.
- 6) ☒ Claim(s) 4 and 9 is/are rejected.
- 7) ☒ Claim(s) 5 and 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/14/05.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

Response to Amendment and Argument

1. This communication is in response to applicant's 07/14/2005 Amendment in the application of Li for a "Multicast concentrators" filed 06/15/2001. This application claims Priority from Provisional Application 60212333 filed 06/16/2000. The proposed amendment to the claims and response have been entered and made of record. Claims 4, 5, 7-10 have been amended. Therefore, examiner has withdrawn the Objections of record to claims 5, 7. Claims 4-11 are pending in the present application.

2. Applicant's amendment and argument to the rejected claims are insufficient to distinguish the claimed invention from the cited prior arts or overcome the rejection of said claims under 35 U.S.C. 103 as discussed below. Applicant's argument with respect to the pending claims have been fully considered, but they are not persuasive for at least the following reasons:

3. Applicant's argument with respect to the rejected claims 4 and 9 (page 9, first paragraph) that the cited references do not disclose "*a multicast concentrator*" or "*a switch capable of multicasting*". However, Lee (US#6,335,930) discloses in Fig. 6 a block circuit diagram illustrated the structure of a multi-stage (NXN) interconnection network which has N input ports and N output ports, for transmitting packets from the input ports to the output ports (*multicast switching*). Lee shows in Fig. 5 an example of the MxM basic switching element, in which M is 3. The switching element 500 has three input ports 501-1, 501-2 and 501-3, and three output ports 502-1, 502-2 and 502-3 (*multicast system*). The output ports 502-1, 502-2 and 502-3 are

also labeled with the numerals '0', '1' and '2'. The two output ports which are labeled '0' and '1', namely the routing ports 502-1 and 502-3, are connected in a perfect shuffle configuration to the next stage. The other output port, which is labelled '2' and is the bypassing port 502-2, is connected to the bypassing port of the switching element in the corresponding position of the next stage (Col. 8, lines 25 plus and Col. Col. 5, lines 61 plus). Furthermore, Yang et al. (US#5,940,389) discloses in Fig. 8 illustrated a conventional switch with Benes networks for performing multicast routing, in which the Benes network comprising comprising an input stage and an output stage (*multicasting*) (Col. 6, lines 6 plus). It's noted that, in a *multicast system*, each input cell specifies one or more outputs, instead of a single output, as is the case in a *unicast system*.

4. Applicant asserts that “ *multicast concentrator is different from a multicast switch*” (Col. 9, second paragraph). However, a multicast concentrator is a switch serving for the combined objective of concentration and multicasting, and in some references in the background art, there is notion of an “*mxn concentrator*”, which means an “*mxn switch*”. There exist many ways to construct an m-to-n concentrator/sorter. Algorithms for the construction of an m-to-n concentrator/sorter by multi-stage interconnection of sorting cells include, as representative of the art, the so-called "knockout tournaments" technique as disclosed by Y. S. Yeh, M. G. Hluchyj, and A. S. Acampora, "The Knockout Switch: A Simple Modular Architecture for High Performance Packet Switching," IEEE J. Select. Areas Commun., vol. 5, pp. 1274-1283, 1987. In a reference entitled "Concentrators in ATM switching," Comp. Sys. Sci. Eng., vol. 6, pp. 335-342, 1996, authored in S. -Y. R. Li and C. -M. Lau (Li-Lau), the authors devised and discussed a

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special m-to-n concentrator, where $m=2n$, as constructed from two n .times. n sorters and n sorting cells.

Therefore, examiner maintains that the references cited and applied in the last office actions for the rejection of the claims are maintained in this office action.

Claim Rejections - 35 USC ' 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by prior art under 35 U.S.C. 103(a).

6. Claims 4 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US#6,335,930) in view of Yang et al. (US#5,940,389).

With respect to claim 4, Lee (US#6,335,930) and Yang et al. (US#5,940,389) disclose a novel system and method for a multi-stage interconnection network having several switching stages, according to the essential features of the claims. Lee discloses in Fig. 6 a block diagram illustrated a multicast switching for use in broadband network, in which a multi-stage (NXN) interconnection network which has N input ports and N output ports, for transmitting packets

from the input ports to the output ports. The network comprises a multi-stage packet switching network having at least $\log_2 M$ switching stages; and each of the switching stages having $N/2$ $M \times M$ switching elements, where M is the number of input or output ports of each switching element. Each switching element at each stage comprises X bypassing input ports, $M-X$ input routing ports, X bypassing output ports and $M-X$ output routing ports, where X is 1 or integer of more than 1. The bypassing output ports of each switching element at each stage are connected to bypassing input ports of each of switching elements which are disposed in a same position of a next stage, respectively, and the output routing ports of each switching element at each stage are connected to input routing ports of each of the switching elements at the next stage by means of perfect shuffle connection See also Figs 1-5; Col. 6, lines 61 plus).

However, Lee does not disclose expressly the bicast signals for routing in multistage interconnection network. In the same field of endeavor, Yang discloses a system and method for assigning routing tag for routing signals through the Benes network with input and output stages comprising 2×2 beta elements (For example see Figs. 11-20; col. 10, lines 32-53), wherein the control circuit generates the routing tags and the comparator generates different control sequences such as '00', '01', '10' and '11' (For example see col. 10, line 40-53, wherein '00' and '11' are '0-bound', '1-bound' values; and '01', '10' are the 'bicast' value) for each input signal (For example see col. 18, line 63 through col. 19, line 18) to support grouping channels, e.g. multicasting.

Regarding claim 9, It's a method claims corresponding to the apparatus claim 4 above. Therefore, claim 9 is analyzed and rejected as previously discussed with respect to claim 4.

One skilled in the art would have recognized the need for effectively and efficiently routing signals in a multicast switching for use in broadband network, and would have applied Yang's novel use of grouping channels utilizing routing tag generator for routing signals into Lee's method for switching packets in a multi-stage interconnection network. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Yang's enhanced partially self routing algorithm for controller Benes networks into Lee's multi-stage interconnection network for high speed packet switching with the motivation being to provide a broadband switching.

Allowable Subject Matter

7. Claims 10, 11 are allowable.
8. Claims 5-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for the indication of allowable subject matter: The closest prior art of record fails to disclose or suggest wherein the total number of the input signals is m , among which the number of 0-bound signal is x_0 , the number of 1-bound signals is x_1 , the number of bicast signals is x_b , and the number of idle signals is $m - x_0 - x_1 - x_b$, the maximum possible total number of 0-bound and bicast ones of the input signals routed to the 0-output group of the concentrator is $\min\{m - n, x_0 + x_b\}$, and the maximum possible total number of 1-bound and bicast ones of the input signals routed to the 1-output group of the concentrator is $\min\{n, x_1 + x_b\}$, as specifically recited in the claims; wherein the 0-bound input

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signals are classified into r_0 priority classes, $r_0 > 1$, and the 1-bound input signals are classified into r_1 priority classes, $r_1 > 1$, and the means for routing includes means for routing the maximum possible total number of 0-bound and bicast ones of the input signals according to the priority classes of the 0-bound input signals to the 0-output group and the maximum possible total number of 1-bound and bicast ones of the input signals according to the priority classes of the 1-bound input signals to the 1-output group, as specifically recited in claims.

9. Claims 4-11 of this application conflict with claims 1-21 of Application 09/882,439, and claims 1-2 of Application No. 09/882,075 and 09/882,112. 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP. 822.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Zhu et al. (US#2003/0118054) discloses a optimizing switching element for minimal latency.

Li et al. (US#2001/0055304) discloses a traffic control mechanism in ATM communications network.

Furukawa et al. (US#6,167,095) discloses a switching concentrator.

McKeown et al. (US#5,923,644) discloses an apparatus and method for processing multicast cells in an input-queued multicast switch.

Wainwright (US#5,497,369) discloses a multicast switch circuits.

10. **THIS ACTION THIS ACTION IS MADE FINAL.** See MPEP ' 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Phan whose telephone number is (571) 272-3149.

The examiner can normally be reached on Mon - Fri from 6:00 to 3:00 EST. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu, can

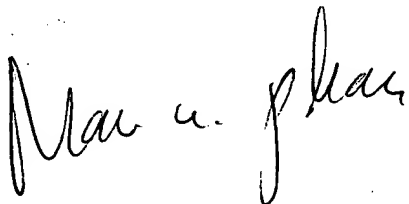
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be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at toll free 1-866-217-9197.

Mphan

09/30/2005.

A handwritten signature in cursive script, appearing to read "Man U. Phan".

MAN U. PHAN
PRIMARY EXAMINER